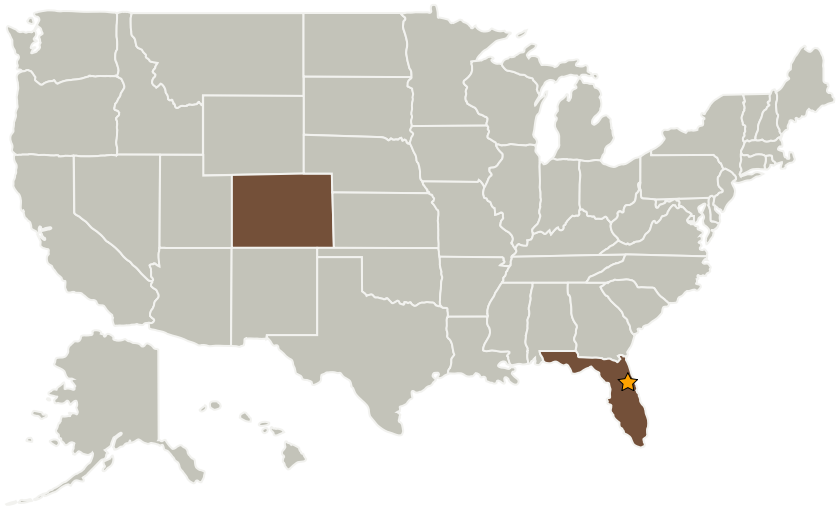
Lunar Sulfur Capture System, Phase II

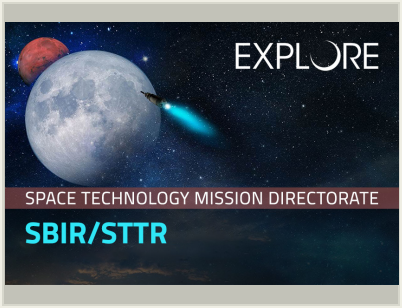
Completed Technology Project (2009 - 2011)

Project Introduction

The Lunar Sulfur Capture System (LSCS) is an innovative method to capture greater than 90 percent of sulfur gases evolved during thermal treatment of lunar soils. LSCS sorbents are based on lunar soil iron compounds that trap sulfur contained in hot in-situ resource utilization (ISRU) product gases. Small amounts of polishing sorbents are used as needed to reduce equilibrium sulfur concentrations to the ppm or sub-ppm level. The LSCS is an effective technology for protecting in-situ resource utilization (ISRU) hardware from damage caused by the corrosive effects of hydrogen sulfide (H2S) and other sulfur-containing gases. Saturated sorbents can be regenerated for reuse, and desorbed sulfur can be converted to elemental sulfur. Key process steps include bulk H2S capture on lunar soil, further capture of H2S on polishing sorbent, regeneration of soil sorbent for re-use, recovery of high-purity H2S, and conversion of H2S to elemental sulfur. The LSCS reduces the risk of using Earth-based sorbents for primary sulfur capture by ensuring a ready supply of sorbent in the event of poor regeneration performance or process upset. The LSCS primary sulfur sorbent can be used as a non-regenerable sorbent if necessary without significant consequence to the ISRU process.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Pioneer Astronautics	Supporting Organization	Industry Historically Underutilized Business Zones (HUBZones)	Lakewood, Colorado

Primary U.S. Work Locations	
Colorado	Florida

Project Transitions

January 2009: Project Start

January 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.1 In-Situ Resource Utilization
    - TX07.1.2 Resource Acquisition, Isolation, and Preparation